

Two New Species of *Juncus* from Sichuan in Southwest China

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Two new species of *Juncus* subgenus *Alpini* collected at Mt. Gonggashan, Sichuan, SW China, *J. gonggae* and *J. trachiphyllus*, were described. *Juncus gonggae* differs from *J. modicus* N. E. Brown by the short anthers and the grooved leaves. *Juncus trachiphyllus* is distinguished from *J. allioides* Franch. and *J. glaucoturgidus* Noltie by the conspicuously scabrid leaves.

Chinese *Juncus* species have been worked by Wu (1994), Lu and Zhang (1987), and Zhang and Lu (1994). Though a considerable number of the Himalayan Junci extend to SW China (Yunnan and Sichuan), the Chinese representatives have been insufficiently recognized and not compared with the Himalayan ones. We found two undescribed species in our field research in Mt. Gonggashan, Sichuan in 1996. One of these is similar to *J. modicus* N. E. Brown endemic to China, whereas the another is close to *J. allioides* Franch. ranging from China, Bhutan, Sikkim, Nepal, Kumaon and Punjab, and *J. glaucoturgidus* Noltie from Nepal.

Juncus gonggae Miyam. & H. Ohba, sp. nov.
(Fig. 1)

Junco modico N. E. Brown similis, sed antheris brevis, foliis supra sulcatis bene differt.

Rhizome very short. Stems ascendent or erect, terete, 4–20 cm long with several grooves. Leaves terete, grooved, auricles round, 0.5–0.7 mm long, sheath basal, brown: cauline leaves almost absent, if present, solitary, lin-

ear, 3–5 cm long. The basal leaves grooved, 1.5–10 cm long, sheaths 0.5–2 cm long, stramineous. The sterile leaves with several grooves, 1.2–15 cm long. Inflorescence capitate with 3–8 flowers, white; bract lanceolate, 1.5–2.0 mm long, 0.5–0.8 mm wide, light brown; lowest bract longer than the flowers sometimes as long as flower, linear-lanceolate, 0.4–1.0 cm long, 0.5–1.0 mm wide, light brown. Flowers viviparous or non viviparous flower, sometimes both mixed in an inflorescence. Normal flowers 5–7 mm long, 5–8 mm wide, pedicels 0.4–0.6 mm long; perianth lanceolate, 3.0–3.5 mm long, 0.8–1.1 mm wide, white; stamens 6, longer than the perianth, 4.5–5.0 mm long; filaments 3.8–4.0 mm long, anthers linear, white, 1.2–1.3 mm long; pistils 3.8–4.5 mm long, styles 0.4–0.8 mm long, stigmas 3, 0.5–0.7 mm long. Capsules ovoid-trigonal, unilocular, 2.9–3.0 mm long, 1.0–1.2 mm wide. Viviparous flowers 3–5 mm long, 3.5–5.0 mm wide; stamen and capsules usually reduced, inner perianth changed into propagules, 3.0–4.5 mm long. Seeds fusiform,

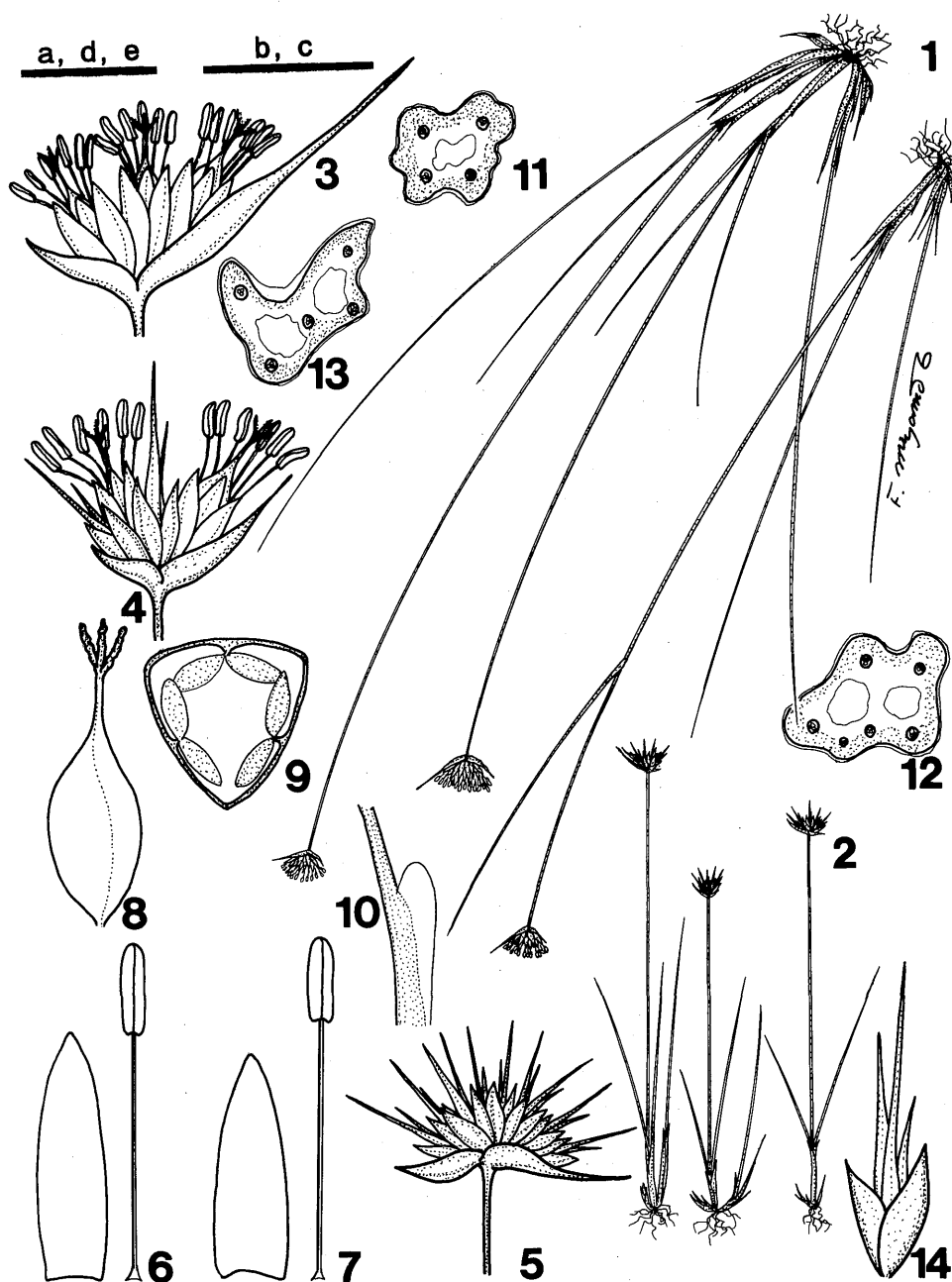


Fig. 1. *Juncus gonggae* (holotype). 1: Habit of plant, with normal inflorescence. 2: Habit of plant, with proliferous inflorescence. 3: Normal inflorescence. 4: Normal and proliferous inflorescence. 5: Proliferous inflorescence. 6: Outer perianth and stamen. 7: Inner perianth and stamen. 8: Capsule. 9: Cross section of capsule. 10: Leaf auricle. 11: Cross section of upper part of stem. 12: Cross section of sterile leaf. 13: Cross section of basal leaf. 14: Proliferous flower. Scales: a (2 cm) for 1; b (5 mm) for 2, 3, 4 and 5; c (2.5 mm) for 6, 7, 8 and 10; d (1 mm) for 9; e (0.5 mm) for 11, 12 and 13.

brown, 0.5–0.6 mm long.

Type: China. Sichuan Province: Daocheng District, Mt. Gonggashan, alt. 4300 m, 25 August, 1996, S. Wu, H. Ikeda, F. Miyamoto, M. Wakabayashi, Y. Yang & T. Kikuchi 1551 (KUN-holo, TI-iso).

Juncus gonggae is similar to *J. modicus* N. E. Brown, but differs by the short anthers and the grooved leaves (Figs. 1–6, 7, 13). The species is often proliferate. In subgenus Alpini, proliferation has been known in *J. trichophyllus* W. W. Smith, *J. harae* Miyam. & H. Ohba and *J. dongchuanensis* K. F. Wu. *Juncus trichophyllus* differs from *J. gonggae* in having axillary bulbils on cauline leaves.

The normal flowered-form of *Juncus gonggae* was found on moosy rock surfaces with *J. concinnus* D. Don and *J. kingii* Rendle in *Abies* and *Larix* forests (elevations between 3600 m and 4300 m). The viviparous form was found only on exposed screes with *J. trachyphyllus* at the margin of *Rhododendron* shrubs.

Juncus trachyphyllus Miyam. & H. Ohba, sp. nov. (Fig. 2)

Juncus allioides Franch. et *J. glaucoturgidus* Noltie similis, sed foliis et caulibusque scabrosis hujus basalibus sulcatis statim dignoscenda.

Rhizome very short. Stems erect, terete, 7–20 cm long, scabrous. Leaves terete, grooved, scabrous, auricles short, sheaths basal, brown. Cauline leaves 1, linear, with several grooves, 1.5–7.0 cm long, shorter than head. Basal leaves 4–10 cm long; sheath 1.0–3.5 cm long, stramineous. Inflorescence 1(–2), flowers 5–15, white; peduncle of the lateral head 1.0–1.5 cm long, with sheathing bract at base, the bract membranous, lanceolate, 3–4 mm long, bracts lanceolate-ovate, 4–7 mm long, 1.5–3.0 mm wide, light brown; lowest bract linear-lanceolate, longer or as long as flowers, 0.8–1.2 cm long, 2.0–3.5 mm wide. Flowers 0.7–1.0 cm

long, 0.8–1.5 cm wide, pedicels 0.8–1.0 mm long. Perianths white, lanceolate; outer ones 4–5 mm long, 0.9–1.0 mm wide, inner ones 4.5–5.5 mm long, 1.0–1.4 mm wide; stamens 6, longer than the perianth, 9–10 mm long, filaments 6.5–7.2 mm long, anthers linear, white, 2.5–2.8 mm long. Pistils 7–8 mm long, styles 2.0–2.5 mm long, stigmas 3, 0.6–0.8 mm long. Capsules 4.4–4.8 mm long, 1.2–1.5 mm wide, ovoid-trigonal, unilocular. Seeds fusiform, 1.5–1.8 mm long.

Type: China. Sichuan Province: Daocheng District, Mt. Gonggashan, alt. 4300 m, 21 August, 1996, S. Wu, H. Ikeda, F. Miyamoto, M. Wakabayashi, Y. Yang & T. Kikuchi 1540 (KUN-holo, TI-iso). Paratype: Mt. Gonggashan, alt. 4000 m, 25 August, 1996, S. Wu et al. 1579 (KUN, TI).

Juncus trachyphyllus is similar to *J. allioides* Franch. and *J. glaucoturgidus* Noltie, but it differs in having scabrid leaves and stems (Fig. 3) and grooved basal leaves (Figs. 2–11, 12). *Juncus glaucoturgidus* has projections on leaf surfaces. The projections of *J. glaucoturgidus* are small and serial, but those of *J. trachyphyllus* are large and random.

We observed leaf surface of *J. trachyphyllus*, *J. allioides*, *J. glaucoturgidus* and *J. kingii* with a scanning electron microscope (JSM-T20). Samples were collected and fixed in formalin-acetic acid-50% alcohol solution in the field. The samples were dehydrated in an alcohol series and coated with gold after dried by applying critical-point methods.

Juncus trachyphyllus has tuberculate projections on smooth ridges and also granules irregularly arranged on grooves (Figs. 3-a, b). Those of *J. glaucoturgidus* are verrucose on corrugated ridges and serially granulate (Figs. 3-c, d). *Juncus allioides* has lower granules and ridges (Fig. 3-e). *Juncus kingii* has projections similar to those of *J. allioides* (Fig. 3-f).

Juncus trachyphyllus was found on exposed scree slopes with *J. kingii* and *J. gonggae* in

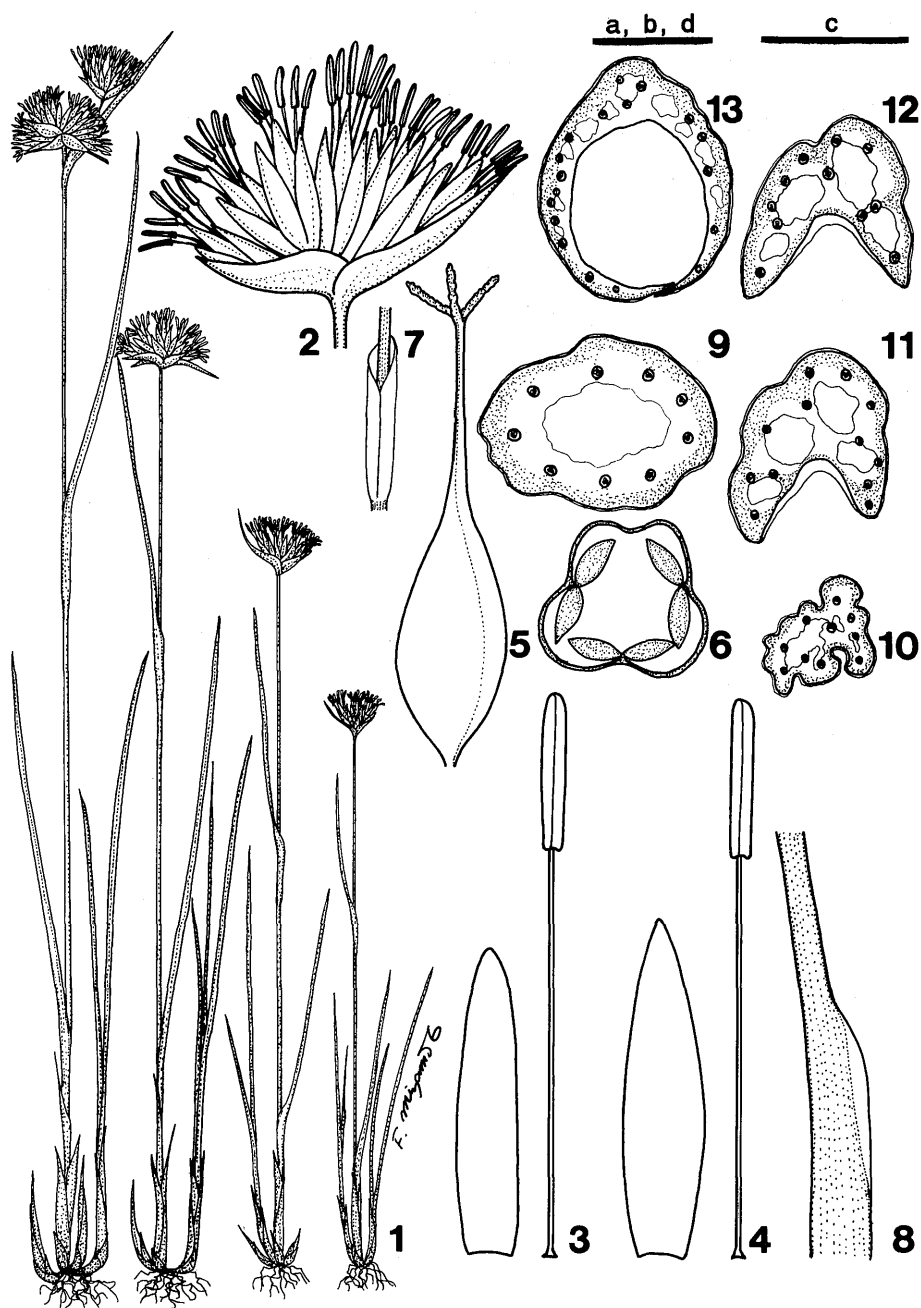


Fig. 2. *Juncus trachyphyllus* (holotype). 1: Habit of plant. 2: Inflorescence. 3: Outer perianth and stamen. 4: Inner perianth and stamen. 5: Capsule. 6: Cross section of capsule. 7: Sheathing bract on peduncle. 8: Leaf auricle. 9: Cross section of lower part of stem. 10: Cross section of cauline leaf. 11: Cross section of upper part of basal leaf. 12: Cross section of lower part of basal leaf. Scales: a (2 cm) for 1; b (5 mm) for 2, 7 and 8; c (2.5 mm) for 3, 4 and 5; d (1 mm) for 6, 9, 10, 11, 12 and 13.

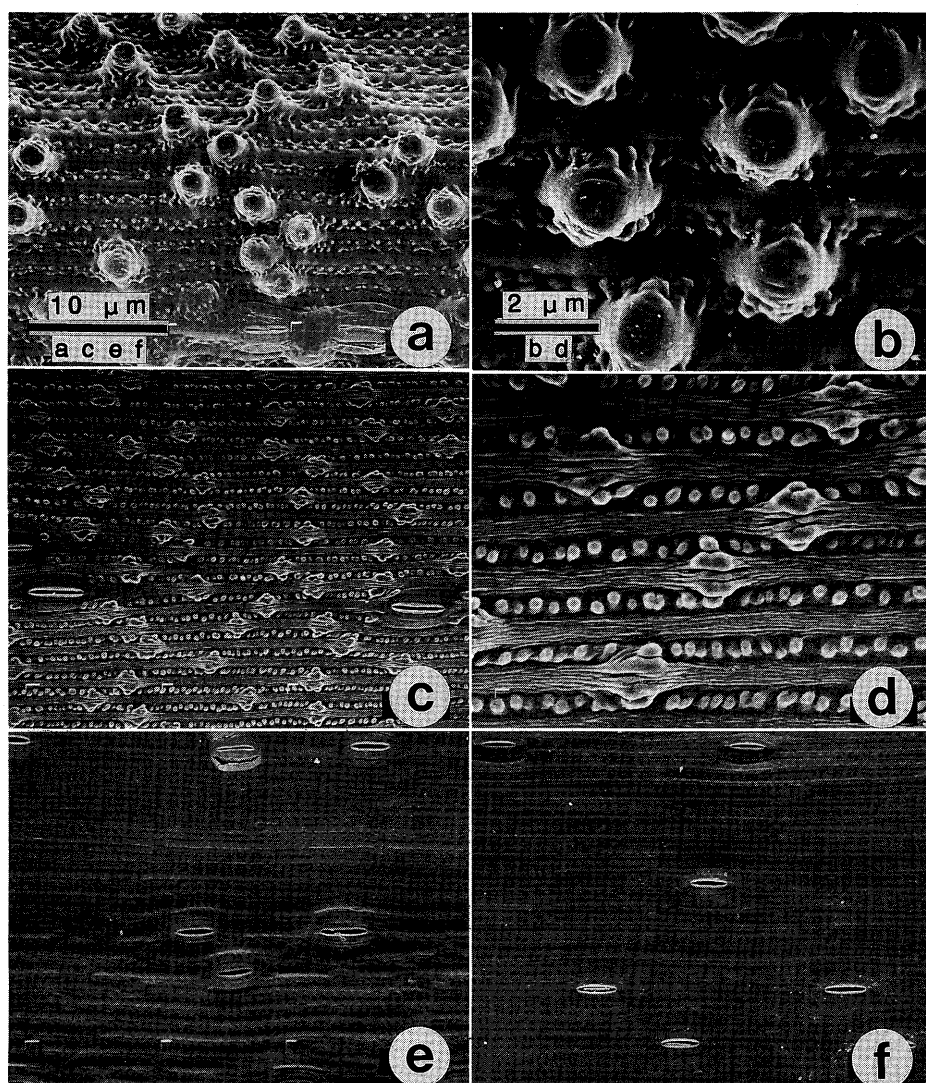


Fig. 3. Microstructure of leaf surface. a, b: *Juncus trachyphyllus* (holotype). c, d: *J. glaucoturpidus* (TI-9220172). e: *J. allioides* (TI-9580221). f: *J. kingii* (TI-9410054).

elevations between 3900 m and 4300 m.

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宮本 太^a, 大場秀章^b, 武 素功^c: 中国四川省産イグサ属の2新種

中国四川省稻城县貢嘎山で採集したイグサ属の2新種を記載した. *Juncus gonggae* は *J. modicus* E. D. Brown に似るが, 葯が短いこと, 花序に無性芽を生ずることによって区別できる. *J. trachiphyllus* は *J. allioides* Franch., *J. glaucoturgidus* Noltie に似るが, 葉と茎は粗面であること, 葉の上面に溝があるこ

とで区別できる. 両2新種は高山帯から亜高山帯に生育し, 他に *J. concinnus* D. Don や *J. kingii* Rendle と混生していた.

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